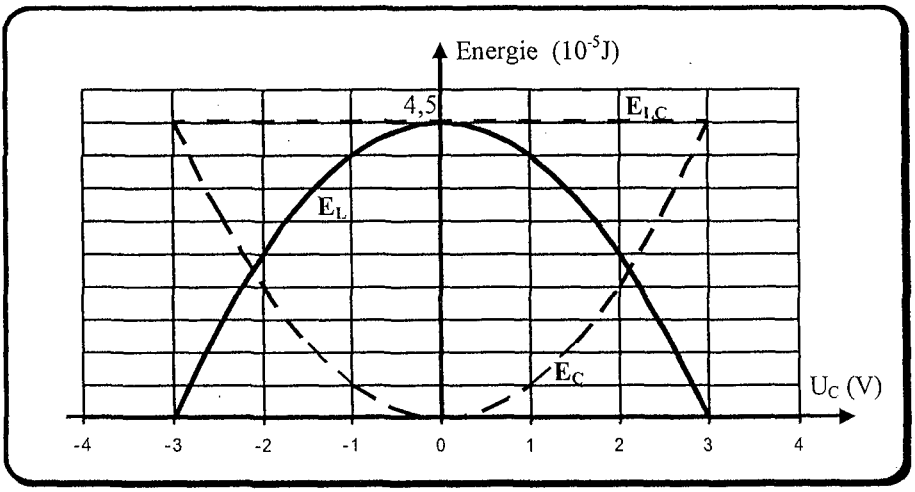

4)

a) $E_L = \frac{3}{4} E_{LC} \Leftrightarrow \frac{1}{2} Li^2 = \frac{3}{4} E_{LC} \Leftrightarrow$

$$i = \pm\sqrt{\frac{3E_{LC}}{2L}} = \pm\sqrt{\frac{3\times 4{,}5.10^{-5}}{2\times 1{,}11}} = \pm\, 7{,}798.10^{-3}\text{A}.$$

b) $i(t) = I_{max} \sin(\omega_0 t + \varphi_i)$;

$I_{max} = I\sqrt{2} = 6{,}364 \,.\, 10^{-3}\sqrt{2} = 9.10^{-3}$ A $\omega_0 = \sqrt{\frac{1}{LC}} = 3 \,.\, 10^2$ rads^{-1}

À t = 0, $u_C = U_{Cmax} \Leftrightarrow \varphi_{uc} = \frac{\pi}{2}$ rad. Or $i = C\frac{duc}{dt} \Leftrightarrow$ i est en

quadrature avance de phase par rapport à $u_C \Leftrightarrow \varphi_i = \varphi_{uc} + \frac{\pi}{2} = \pi$ rad $\Leftrightarrow$

$i(t) = 9.10^{-3} \sin(\frac{2\pi}{T} t + \pi)]$ i en (A) et t en (s)

$$i(t) = 7{,}798\ 10^{-3} \Rightarrow \sin(\frac{2\pi}{T} t + \pi) = \frac{7{,}798.10^{-3}}{9.10^{-3}} = 0{,}866 \Leftrightarrow$$

$$\frac{2\pi}{T} t + \pi = \pm\frac{\pi}{3} + K\pi \Leftrightarrow \boxed{t = (k - 1 \pm \frac{1}{3})\frac{T}{2}} \quad \forall\, t > 0$$

Qarray.tn Aqra Blech- Qarray.tn